CPC COOPERATIVE PATENT CLASSIFICATION

C07F ACYCLIC, CARBOCYCLIC OR HETEROCYCLIC COMPOUNDS CONTAINING ELEMENTS OTHER THAN CARBON, HYDROGEN, HALOGEN, OXYGEN, NITROGEN, SULFUR, SELENIUM OR TELLURIUM (metal-containing porphyrins C07D 487/22)

NOTE

Attention is drawn to Note (3) C07 , which defines the last place priority rule applied in the range of subclasses C07C -C07K and within these subclasses.

Attention is drawn to Note (6) following the title of class C07 .

Attention is drawn to Note (3) after the title of section C, which Note indicates to which version of the periodic table of chemical elements the IPC refers.

In this subclass , organic acid salts, alcoholates, phenates, chelates or mercaptides are classified as the parent compounds.

Compounds containing Se or Te are classified with their sulfur homologues

A hydrocarbon chain is considered to be terminated by a heteroatom or by a carbon atom having three bonds to heteroatoms with at the most one to halogen

When groups, e.g. aromatic or aliphatic groups, are mentioned without further indications, it means that the group concerned can be further substituted. Otherwise it will be indicated, e.g. C07F 9/11 with hydroxyalkyl compounds without further substituents on alkyl.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups are classified in the following CPC groups:

C07F 9/6593 covered by C07F 9/65815

C07F 1/00 Compounds containing elements of the 1st Group of the Periodic System

C07F 1/005 . { without C-Metal linkages }

C07F 1/02 . Lithium compounds

C07F 1/04 . Sodium compounds

C07F 1/06 . Potassium compounds

C07F 1/08 . Copper compounds

C07F 1/10 . Silver compounds

C07F 1/12 . Gold compounds

C07F 3/00 Compounds containing elements of the 2nd Group of the Periodic System

C07F 3/003 . { without C-Metal linkages }

C07F 3/006 . { Beryllium compounds }

C07F 3/02 . Magnesium compounds

C07F 3/04 . Calcium compounds

C07F 3/06 . Zinc compounds

C07F 3/08 . Cadmium compounds

C07F 3/10 . Mercury compounds
C07F 3/103 . . { without C-Mercury linkages }
C07F 3/106 . . { Aliphatic substances containing mercury }
C07F 3/12 . . Aromatic substances containing mercury
C07F 3/14 . . Heterocyclic substances containing mercury

C07F 5/00 Compounds containing elements of the 3rd Group of the Periodic System

C07F 5/003 . { without C-Metal linkages }

C07F 5/006 . { Addition and condensation products with amines or phosphines }

C07F 5/02 . Boron compounds
C07F 5/022 . . { without C-boron linkages }
C07F 5/025 . . { Boronic and borinic acid compounds }
C07F 5/027 . . { Organoboranes and organoborohydrides }
C07F 5/04 . . Esters of boric acids
C07F 5/05 . . Cyclic compounds having at least one ring containing boron but no carbon in the ring

C07F 5/06 . Aluminium compounds
C07F 5/061 . . { with C-aluminium linkage }
C07F 5/062 . . . { Al linked exclusively to C }
C07F 5/063 . . . . { compounds containing only Al, C, H and Al is not a ring element }
C07F 5/064 . . . { compounds with an Al-Halogen linkage }
C07F 5/065 . . . { compounds with an Al-H linkage }
C07F 5/066 . . . { compounds with Al linked to an element other than Al, C, H or halogen (this includes Al-cyanide linkage) }

C07F 5/067 .... { compounds with Al also linked to H or halogen }
C07F 5/068 .... { preparation of alum(in)oxanes }
C07F 5/069 .. { without C-aluminium linkages }

C07F 7/00 Compounds containing elements of the 4th Group of the Periodic System

C07F 7/003 . { without C-Metal linkages }
C07F 7/006 .. { of group 4B of the Periodic System }

C07F 7/02 . Silicon compounds
C07F 7/025 .. { without C-silicon linkages }
C07F 7/04 .. Esters of silicic acids
C07F 7/045 ... { Esters of monosilicic acid }
C07F 7/06 ... with hydroxyaryl compounds
C07F 7/07 ... Cyclic esters
C07F 7/08 .. Compounds having one or more C-Si linkages
C07F 7/0801 ... { General processes }
C07F 7/0803 ... { Compounds with Si-C or Si-Si linkages }
C07F 7/0805 .... { comprising only Si, C or H atoms }
C07F 7/0807 ..... { comprising Si as a ring atom }
C07F 7/0809 ..... { comprising no Si as a ring atom }
C07F 7/081 .... { comprising at least one atom selected from the elements N, O, halogen, S, Se or Te }
C07F 7/0812 ..... { comprising a heterocyclic ring }
C07F 7/0814 ..... { said ring is substituted at a C ring atom by Si }
C07F 7/0816 ..... { said ring comprising Si as a ring atom }
C07F 7/0818 ..... { comprising no heterocyclic ring }
C07F 7/082 .... { comprising at least one atom selected from elements other than Si, C, H, N, O, halogen, S, Se or Te }
C07F 7/0821 .... { comprising at least one Si-Si linkage }
C07F 7/0823 .... { comprising at least one Si-cyano linkage }
C07F 7/0825 .... { Preparations of compounds not comprising Si-Si or Si-cyano linkages }
C07F 7/0827 ..... { Syntheses with formation of a Si-C bond }
C07F 7/0829 ..... { Hydrosilylation reactions }
C07F 7/083 ..... { Syntheses without formation of a Si-C bond }
C07F 7/0832 ..... { Other preparations }
C07F 7/0834 ... { Compounds having one or more O-Si linkage (for compounds with C-O-Si linkages see C07F 7/18) }
C07F 7/0836 .... { Compounds with one or more Si-OH or Si-O-metal linkage }
C07F 7/0838 .... { Compounds with one or more Si-O-Si sequences }
C07F 7/084 ..... { containing a ring comprising a Si-O-Si sequence (compounds with a ring containing only alternating Si and O atoms , i.e. cyclosiloxanes C07F 7/21) }
C07F 7/0841 ..... { also comprising a C atom }

C07F 7/0843 ..... { also comprising an atom different from Si, O and C }

C07F 7/0845 ..... { not containing a ring comprising a Si-O-Si sequence }

C07F 7/0847 ..... { a Si atom of a Si-O-Si sequence being attached only to -O-Si or to a C atom }

C07F 7/0849 ..... { this C atom being part of a group which contains only C and H }

C07F 7/085 ..... { this C atom being part of a group which contains halogen }

C07F 7/0852 ..... { this C atom being part of a group which contains O }

C07F 7/0854 ..... { this C atom being part of a group which contains N }

C07F 7/0856 ..... { this C atom being part of a group which contains an element other than C, H, O, N and halogen }

C07F 7/0858 ..... { a Si atom of a Si-O-Si sequence having linkages other than Si-O-Si or bonds other than Si-C }

C07F 7/0859 ..... { Si-OX bond, X = H or C }

C07F 7/0861 ..... { Si-Halogen bond }

C07F 7/0863 ..... { Si-N bond }

C07F 7/0865 ..... { Si-O-N bond }

C07F 7/0867 ..... { Si-H bond }

C07F 7/0869 ..... { Si-Q bond, Q different from O, N, H and halogen }

C07F 7/087 ..... { Compounds of unknown structure containing a Si-O-Si sequence }

C07F 7/0872 ..... { Preparation and treatment thereof }

C07F 7/0874 ..... { Reactions involving a bond of the Si-O-Si linkage }

C07F 7/0876 ..... { Reactions involving the formation of bonds to a Si atom of a Si-O-Si sequence other than a bond of the Si-O-Si linkage }

C07F 7/0878 ..... { Si-C bond }

C07F 7/0879 ..... { Hydrosilylation reactions }

C07F 7/0881 ..... { Other reactions }

C07F 7/0883 ..... { Si-halogen bond }

C07F 7/0885 ..... { Si-OX bond (X = C or H) }

C07F 7/0887 ..... { Si-Q bond (Q different from O, C or halogen) }

C07F 7/0889 ..... { Reactions not involving the Si atom of the Si-O-Si sequence }

C07F 7/089 ..... { Treatments not covered by a preceding group }

C07F 7/0892 .... { Compounds with a Si-O-N linkage }

C07F 7/0894 .... { Compounds with a Si-O-O linkage }

C07F 7/0896 ... { Compounds with a Si-H linkage }

C07F 7/0898 ... { Compounds with a Si-S linkage }

C07F 7/10 ... Containing nitrogen { having a Si-N linkage }

C07F 7/12 ... Organo silicon halides

C07F 7/121 .... { Preparation or treatment not provided for in C07F 7/14, C07F 7/16 or C07F 7/20 }

NOTE

The silicon atom involved in the reaction that is attached or becomes attached to the highest number of halide atoms determines classification

C07F 7/122 ..... { by reactions involving the formation of Si-C linkages (hydrosilylation reactions C07F 7/14; direct synthesis C07F 7/16) }

C07F 7/123 ..... { by reactions involving the formation of Si-halogen linkages }

C07F 7/125 ..... { by reactions involving both Si-C and Si-halogen linkages, the Si-C and Si-halogen linkages can be to the same or to different Si atoms, e.g. redistribution reactions }

C07F 7/126 ..... { by reactions involving the formation of Si-Y linkages, where Y is not a carbon or halogen atom }

C07F 7/127 ..... { by reactions not affecting the linkages to the silicon atom }

C07F 7/128 ..... { by reactions covered by more than one of the groups C07F 7/122 to C07F 7/127 and of which the starting material is unknown or insufficiently determined }

C07F 7/14 .... Preparation thereof from { optionally substituted } halogenated silanes and hydrocarbons { hydrosilylation reactions }

C07F 7/16 .... Preparation thereof from silicon and halogenated hydrocarbons { direct synthesis }

C07F 7/18 ... Compounds having one or more C-Si linkages as well as one or more C-O-Si linkages

C07F 7/1804 .... { Compounds having Si-O-C linkages (Si-O-acyl linkages C07F 7/1896) }

C07F 7/1808 ..... { the Si-C and Si-O-C linkages being at different Si atoms }

C07F 7/1812 ..... { having (C1)a-Si-(OC2)b linkages, a and b each being >=1 and a+b = 4, C1 and C2 being hydrocarbon or substituted hydrocarbon radicals }

C07F 7/1816 ..... { a and b being alternatively specified }

C07F 7/182 ..... { C1 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms }

C07F 7/1824 ..... { C2 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms }

C07F 7/1828 ..... { C1 and C2 containing aliphatic or cycloaliphatic unsaturated bonds or heteroatoms }

C07F 7/1832 ..... { compounds not provided for in C07F 7/182 to C07F 7/1824 }

C07F 7/1836 ..... { a being 1, b being 3 }

C07F 7/184 ..... { a being 2, b being 2 }

C07F 7/1844 ..... { a being 3, b being 1 }

C07F 7/1848 ..... { C1 being an unsubstituted acyclic saturated hydrocarbon radical containing less than six carbon atoms, a benzyl radical, a phenyl radical, or a methyl substituted phenyl radical }

C07F 7/1852 ..... { C2 being an acyclic, arylaliphatic or a non-condensed aromatic radical containing only carbon, hydrogen, halogen, oxygen, nitrogen or sulfur }

C07F 7/1856 ..... { C2 containing cycloaliphatic, heterocyclic or condensed aromatic rings }

C07F 7/186 ..... { C2 containing an azetidine radical or condensed azetidine radical }

C07F 7/1864 ..... { C2 containing elements other than carbon, hydrogen, halogen, oxygen, nitrogen or sulfur }

C07F 7/1868 ..... { having (C1)a-Si-(OC2)b linkages, a and b each being >=1 and a+b # 4 (C1 and C2 being hydrocarbon or substituted hydrocarbon radicals) }

C07F 7/1872 ..... { Preparation; Treatments not provided for in C07F 7/20 }

C07F 7/1876 . . . . . { by reactions involving the formation of Si-C linkages }
C07F 7/188 . . . . . { by reactions involving the formation of Si-O linkages }
C07F 7/1884 . . . . . { by dismutation }
C07F 7/1888 . . . . . { by reactions involving the formation of other Si-linkages, e.g. Si-N }
C07F 7/1892 . . . . . { by reactions not provided for in C07F 7/1876 to C07F 7/1888 }
C07F 7/1896 . . . . { Compounds having one or more Si-O-acyl linkages }
C07F 7/20 . . . Purification, separation
C07F 7/21 . . Cyclic compounds having at least one ring containing silicon, but no carbon in the ring

C07F 7/22 . Tin compounds
C07F 7/2204 . . { Not belonging to the groups C07F 7/2208 to C07F 7/2296 }
C07F 7/2208 . . { Compounds having tin linked only to carbon, hydrogen and/or halogen }
C07F 7/2212 . . . { Compounds having only tin-carbon linkages }
C07F 7/2216 . . . { Compounds having one or more tin-halogen linkages }
C07F 7/222 . . . { Compounds having one or more tin-hydrogen linkages }
C07F 7/2224 . . { Compounds having one or more tin-oxygen linkages }
C07F 7/2228 . . . { Compounds not belonging to the groups C07F 7/2232 to C07F 7/2252 }
C07F 7/2232 . . . { Compounds having one or more Sn-O-R linkages (R=H or C, except if C belongs to a carboxyl group) }
C07F 7/2236 . . . { Compounds with a Sn=O linkage }
C07F 7/224 . . . . { Stannoic acids and their esters }
C07F 7/2244 . . . { Tin esters of organic acids }
C07F 7/2248 . . . { Tin esters of inorganic acids }
C07F 7/2252 . . . { Compounds with a Sn-O-metal linkage }
C07F 7/2256 . . . . { Compounds containing a Sn-O-Sn linkage }
C07F 7/226 . . { Compounds with one or more Sn-S linkages }
C07F 7/2264 . . . { Compounds not belonging to group C07F 7/2268 to C07F 7/2276 }
C07F 7/2268 . . . { Compounds having one or more Sn-S-R linkages (R=H or C, except if C belongs to a carboxyl group) }
C07F 7/2272 . . . { Esters of thiocarboxylic acids and their derivatives }
C07F 7/2276 . . . { Compounds with one or more Sn-S-metal linkages }
C07F 7/228 . . . . { Compounds with one or more Sn-S-Sn linkages }
C07F 7/2284 . . { Compounds with one or more Sn-N linkages }
C07F 7/2288 . . { Compounds with one or more Sn-metal linkages }
C07F 7/2292 . . . { Compounds with one or more Sn-Sn linkages }
C07F 7/2296 . . { Purification, stabilisation, isolation }

C07F 7/24 . { Lead compounds }
C07F 7/26 . . Tetra-alkyl lead compounds

C07F 7/28 . Titanium compounds

C07F 7/30 . Germanium compounds

C07F 9/00 **Compounds containing elements of the 5th Group of the Periodic System**

C07F 9/005 . { Compounds of elements of group 5B without metal-carbon linkages }

C07F 9/02 . Phosphorus compounds (sugar phosphates C07H 11/04; nucleotides C07H 19/00, C07H 21/00; nucleic acids C07H 21/00)

C07F 9/025 . . { Purification; Separation; Stabilisation; Desodorisation of organo-phosphorus compounds (of natural phosphatides C07F 9/103; phosphines C07F 9/5095) }

C07F 9/04 . . Reaction products of phosphorus sulfur compounds with hydrocarbons

C07F 9/06 . . without P-C bonds

C07F 9/062 . . . { Organo-phosphoranes without P-C bonds }

C07F 9/065 . . . . { Phosphoranes containing the structure P=N- }

C07F 9/067 . . . . . { Polyphosphazenes containing the structure [P=N- }n (cyclic compounds 9/6581F)]

C07F 9/08 . . . Esters of oxyacids of phosphorus { (C07F 9/062 takes precedence) }

C07F 9/09 . . . . Esters of phosphoric acids

C07F 9/091 . . . . . { with hydroxyalkyl compounds with further substituents on alkyl }

C07F 9/092 . . . . . { substituted by B, Si or a metal }

C07F 9/093 . . . . . { Polyol derivatives esterified at least twice by phosphoric rests }

C07F 9/094 . . . . . { with arylalkanols }

C07F 9/095 . . . . . { Compounds containing the structure P(=O)-O-acyl, P(=O)-O-heteroatom, P(=O)-O-CN }

C07F 9/096 . . . . . { Compounds containing the structure P(=O)-O-C(=X)- (X = O, S, Se) }

C07F 9/097 . . . . . { Compounds containing the structure P(=O)-O-N }

C07F 9/098 . . . . . { Esters of polyphosphoric acids or anhydrides }

C07F 9/10 . . . . . Phosphatides, e.g. lecithin

C07F 9/103 . . . . . { Extraction or purification by physical or chemical treatment of natural phosphatides; Preparation of compositions containing phosphatides of unknown structure }

C07F 9/106 . . . . . { Adducts, complexes, salts of phosphatides }

C07F 9/11 . . . . . with hydroxyalkyl compounds without further substituents on alkyl

C07F 9/113 . . . . . with unsaturated acyclic alcohols

C07F 9/117 . . . . . with cycloaliphatic alcohols

C07F 9/12 . . . . . with hydroxyaryl compounds

C07F 9/14 . . . . . containing P(=O)-halide groups

C07F 9/1403 . . . . . { containing the structure Hal-P(=O)-O-unsaturated acyclic rest }

C07F 9/1406 . . . . . { containing the structure Hal-P(=O)-O-aryl }

C07F 9/141 . . . . Esters of phosphorous acids

C07F 9/1411 . . . . . { with hydroxyalkyl compounds with further substituents on alkyl }

C07F 9/1412 . . . . . { Polyol derivatives esterified at least twice by phosphorous acid rests }

C07F 9/1414 . . . . . { with arylalkanols }

C07F 9/1415 . . . . . { Compounds containing the structure P-O-acyl, P-O-heteroatom, P-O-CN }

C07F 9/1417 . . . . . { Compounds containing the structure P-O-C(=X)- (X = O, S, Se) }
C07F 9/1418 . . . . . { Compounds containing the structure P-O-N }
C07F 9/142 . . . . . with hydroxyalkyl compounds without further substituents on alkyl
C07F 9/143 . . . . . with unsaturated acyclic alcohols
C07F 9/144 . . . . . with cycloaliphatic alcohols
C07F 9/145 . . . . . with hydroxyaryl compounds
C07F 9/146 . . . . . containing P-halide groups
C07F 9/16 . . . Esters of thiophosphoric acids or thiophosphorous acids
C07F 9/165 . . . . Esters of thiophosphoric acids
C07F 9/1651 . . . . . { with hydroxyalkyl compounds with further substituents on alkyl }
C07F 9/1652 . . . . . { Polyol derivatives esterified at least twice by (thio)phosphoric acid esters }
C07F 9/1653 . . . . . { with arylalkanols }
C07F 9/1654 . . . . . { Compounds containing the structure P(=X)n-X-acyl, P(=X)n-X-heteroatom, P(=X)n-X-CN (X = O, S, Se; n = 0, 1) }
C07F 9/1655 . . . . . { Compounds containing the structure P(=X)n-S-(S)x- (X = O, S, Se; n=0,1; x>=1) }
C07F 9/1656 . . . . . { Compounds containing the structure P(=X)n-X-C(=X)- (X = O, S, Se; n = 0, 1) }
C07F 9/1657 . . . . . { Compounds containing the structure P(=X)n-X-N (X = O, S, Se; n = 0, 1) }
C07F 9/1658 . . . . . { Esters of thiopolyphosphoric acids or anhydrides }
C07F 9/17 . . . . . with hydroxyalkyl compounds without further substituents on alkyl
C07F 9/173 . . . . . with unsaturated acyclic alcohols
C07F 9/177 . . . . . with cycloaliphatic alcohols
C07F 9/18 . . . . . with hydroxyaryl compounds
C07F 9/20 . . . . . containing P-halide groups
C07F 9/2003 . . . . . { containing the structure Hal-P-X-unsaturated acyclic rest }
C07F 9/2006 . . . . . { containing the structure Hal-P-X-aryl }
C07F 9/201 . . . . Esters of thiophosphorus acids
C07F 9/2015 . . . . . { with hydroxyalkyl compounds with further substituents on alkyl }
C07F 9/202 . . . . . with hydroxyl compounds without further substituents on alkyl
C07F 9/203 . . . . . with unsaturated acyclic alcohols
C07F 9/204 . . . . . with cycloaliphatic alcohols
C07F 9/205 . . . . . with hydroxyaryl compounds
C07F 9/206 . . . . . containing P-halide groups
C07F 9/22 . . . Amides of acids of phosphorus
C07F 9/222 . . . . { Amides of phosphoric acids }
C07F 9/224 . . . . { Phosphorus triamides }
C07F 9/226 . . . . { containing the structure P-isocyanates }
C07F 9/228 . . . . { containing the structure P-N-N, e.g. azides, hydrazides }
C07F 9/24 . . . . Esteramides
C07F 9/2404 . . . . . { the ester moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/2408 ..... { of hydroxyalkyl compounds }
C07F 9/2412 ..... { of unsaturated acyclic alcohols }
C07F 9/2416 ..... { of cycloaliphatic alcohols }
C07F 9/242 ..... { of hydroxyaryl compounds }
C07F 9/2425 ..... { containing the structure (RX)(RR'N)P(=Y)-Z-(C)n-Z'-P(=Y)(XR)2 (X = O, S, NR; Y = O, S, electron pair; Z = O, S; Z' = O, S) }
C07F 9/2429 ..... { of arylalkanols }
C07F 9/2433 ..... { Compounds containing the structure N-P(=X)n-X-acyl, N-P(=X)n-X-heteroatom, N-P(=X)n-X-CN (X = O, S, Se; n = 0, 1) }
C07F 9/2437 ..... { Compounds containing the structure N-P(=X)n-S-(S)x- (X = O, S, Se; n=0,1; x>=1) }
C07F 9/2441 ..... { containing the structure N-P(=X)n-X-C(=X) (X = O, S, Se; n = 0, 1) }
C07F 9/2445 ..... { containing the structure N-P(=X)n-X-N (X = O, S, Se; n = 0, 1) }
C07F 9/245 ..... { containing the structure N-P(=X)n-X-P (X = O, S, Se; n = 0, 1) }
C07F 9/2454 ..... { the amide moiety containing a substituent or a structure which is considered as characteristic }
C07F 9/2458 ..... { of aliphatic amines }
C07F 9/2462 ..... { of unsaturated acyclic amines }
C07F 9/2466 ..... { of cycloaliphatic amines }
C07F 9/247 ..... { of aromatic amines (N-C aromatic linkage) }
C07F 9/2475 ..... { of aralkylamines }
C07F 9/2479 ..... { Compounds containing the structure P(=X)n-N-acyl, P(=X)n-N-heteroatom, P(=X)n-N-CN (X = O, S, Se; n = 0, 1) }
C07F 9/2483 ..... { containing the structure P(=X)n-N-S (X = O, S, Se; n = 0, 1) }
C07F 9/2487 ..... { containing the structure P(=X)n-N-C(=X) (X = O, S, Se; n = 0, 1) }
C07F 9/2491 ..... { containing the structure P(=X)n-N-N (X = O, S, Se; n = 0, 1) }
C07F 9/2495 ..... { containing the structure P(=X)n-N-P (X = O, S, Se; n = 0, 1) }
C07F 9/26 .... containing P-halide groups
C07F 9/28 .. with one or more P-C bonds
C07F 9/30 ... Phosphinic acids R2P(=O)(OH); Thiophosphinic acids { i.e. R2P(=X)(XH) (X = S, Se) }
C07F 9/301 .... { Acyclic saturated acids which can have further substituents on alkyl }
C07F 9/302 .... { Acyclic unsaturated acids }
C07F 9/303 .... { Cycloaliphatic acids }
C07F 9/304 .... { Aromatic acids (P-C aromatic linkage) }
C07F 9/305 .... { Poly(thio)phosphinic acids }
C07F 9/306 .... { Arylalkanephosphinic acids, e.g. Ar-(CH2)n-P(=X)(R)(XH), (X = O,S, Se; n>=1) }
C07F 9/307 .... { Acids containing the structure -C(=X)-P(=X)(R)(XH) or NC-P(=X)(R)(XH), (X = O, S, Se) }
C07F 9/308 .... { Pyrophosphinic acids; Phosphinic acid anhydrides }
C07F 9/32 .... Esters thereof
C07F 9/3205 ..... { the acid moiety containing a substituent or a structure which is

considered as characteristic }

C07F 9/3211 . . . . . { Esters of acyclic saturated acids which can have further substituents on alkyl }

C07F 9/3217 . . . . . { Esters of acyclic unsaturated acids }

C07F 9/3223 . . . . . { Esters of cycloaliphatic acids }

C07F 9/3229 . . . . . { Esters of aromatic acids (P-C aromatic linkage) }

C07F 9/3235 . . . . . { Esters of poly(thio)phosphinic acids }

C07F 9/3241 . . . . . { Esters of arylalkanephosphinic acids }

C07F 9/3247 . . . . . { Esters of acids containing the structure -C(=X)-P(=X)(R)(XH) or NC-P(=X)(R)(XH), (X = O, S, Se) }

C07F 9/3252 . . . . . { containing the structure -C(=X)-P(=X)(R)(XR), (X = O, S, Se) }

C07F 9/3258 . . . . . { the ester moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/3264 . . . . . { Esters with hydroxyalkyl compounds }

C07F 9/327 . . . . . { Esters with unsaturated acyclic alcohols }

C07F 9/3276 . . . . . { Esters with cycloaliphatic alcohols }

C07F 9/3282 . . . . . { Esters with hydroxyaryl compounds }

C07F 9/3288 . . . . . { Esters with arylalkanols }

C07F 9/3294 . . . . . { Compounds containing the structure R2P(=X)-X-acyl, R2P(=X)-X-heteroatom, R2P(=X)-X-CN (X = O, S, Se) }

C07F 9/34 . . . . Halides thereof

C07F 9/36 . . . . Amides thereof

C07F 9/38 . . . Phosphonic acids RP(=O)(OH)2; Thiophosphonic acids { i.e. RP(=X)(XH)2 (X = S, Se) }

C07F 9/3804 . . . . { not used, see subgroups }

C07F 9/3808 . . . . . { Acyclic saturated acids which can have further substituents on alkyl }

C07F 9/3813 . . . . . { N-Phosphonomethylglycine; Salts or complexes thereof }

C07F 9/3817 . . . . . { Acids containing the structure (RX)2P(=X)-alk-N...P (X = O, S, Se) }

C07F 9/3821 . . . . . { substituted by B, Si, P or a metal (C07F 9/3839 takes precedence) }

C07F 9/3826 . . . . . { Acyclic unsaturated acids }

C07F 9/383 . . . . . { Cycloaliphatic acids }

C07F 9/3834 . . . . . { Aromatic acids (P-C aromatic linkage) }

C07F 9/3839 . . . . . { Polyphosphonic acids }

C07F 9/3843 . . . . . { containing no further substituents than -PO3H2 groups }

C07F 9/3847 . . . . . { Acyclic unsaturated derivatives }

C07F 9/3852 . . . . . { Cycloaliphatic derivatives }

C07F 9/3856 . . . . . { containing halogen or nitro(so) substituents }

C07F 9/386 . . . . . { containing hydroxy substituents in the hydrocarbon radicals }

C07F 9/3865 . . . . . { containing sulfur substituents }

C07F 9/3869 . . . . . { containing carboxylic acid or carboxylic acid derivative substituents }

C07F 9/3873 . . . . . { containing nitrogen substituents e.g. N.....H or N-hydrocarbon rest which can be substituted by halogen or nitro(so), N.....O, N.....S, N.....C(=X)- (X =O, S), N.....N, N...C(=X)...N (X =O, S) }

C07F 9/3878 ..... { containing substituents selected from B, Si, P (other than -PO3H2 groups) or a metal }

C07F 9/3882 ..... { Arylalkanephosphonic acids (C07F 9/3839 takes precedence) }

C07F 9/3886 ..... { Acids containing the structure -C(=X)-P(=X)(XH)2 or NC-P(=X)(XH)2, (X = O, S, Se) }

C07F 9/3891 ..... { Acids containing the structure -C(=X)-P(=X)(XH)2, (X = O, S, Se) }

C07F 9/3895 .... { Pyrophosphonic acids; phosphonic acid anhydrides }

C07F 9/40 .... Esters thereof

C07F 9/4003 ..... { the acid moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/4006 ..... { Esters of acyclic acids which can have further substituents on alkyl }

C07F 9/4009 ..... { Esters containing the structure (RX)2P(=X)-alk-N...P (X = O, S, Se) }

C07F 9/4012 ..... { substituted by B, Si, P or a metal (C07F 9/4025 takes precedence) }

C07F 9/4015 ..... { Esters of acyclic unsaturated acids }

C07F 9/4018 ..... { Esters of cycloaliphatic acids }

C07F 9/4021 ..... { Esters of aromatic acids (P-C aromatic linkage) }

C07F 9/4025 ..... { Esters of poly(thio)phosphonic acids }

C07F 9/4028 ..... { containing no further substituents than -PO3H2 groups in free or esterified form }

C07F 9/4031 ..... { Acyclic unsaturated derivatives }

C07F 9/4034 ..... { Cycloaliphatic derivatives }

C07F 9/4037 ..... { containing halogen or nitro(so) substituents }

C07F 9/404 ..... { containing hydroxy substituents in the hydrocarbon radicals }

C07F 9/4043 ..... { containing sulfur substituents }

C07F 9/4046 ..... { containing carboxylic acid or carboxylic acid derivative substituents }

C07F 9/405 ..... { containing nitrogen substituents e.g. N.....H or N-hydrocarbon rest which can be substituted by halogen or nitro(so), N.....O, N.....S, N.....C(=X)- (X =O, S), N.....N, N...C(=X)...N (X =O, S) }

C07F 9/4053 ..... { containing substituents selected from B, Si, P (other than -PO3H2 groups in free or esterified form), or a metal }

C07F 9/4056 ..... { Esters of arylalkanephosphonic acids (C07F 9/4025 takes precedence) }

C07F 9/4059 ..... { Compounds containing the structure (RY)2P(=X)-CH2 }n-C(=O)-(CH2)m-Ar, (X, Y = O, S, Se; n>=1, m>=0])

C07F 9/4062 ..... { Esters of acids containing the structure -C(=X)-P(=X)(XR)2 or NC-P(=X)(XR)2, (X = O, S, Se) }

C07F 9/4065 ..... { Esters of acids containing the structure -C(=X)-P(=X)(XR)2, (X = O, S, Se) }

C07F 9/4068 ..... { Esters of pyrophosphonic acids; Esters of phosphonic acid anhydrides }

C07F 9/4071 ..... { the ester moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/4075 ..... { Esters with hydroxyalkyl compounds }

C07F 9/4078 ..... { Esters with unsaturated acyclic alcohols }

C07F 9/4081 . . . . . { Esters with cycloaliphatic alcohols }

C07F 9/4084 . . . . . { Esters with hydroxyaryl compounds }

C07F 9/4087 . . . . . { Esters with arylalkanols }

C07F 9/409 . . . . . { Compounds containing the structure P(=X)-X-acyl, P(=X)-X-heteroatom, P(=X)-X-CN (X = O, S, Se) }

C07F 9/4093 . . . . . { Compounds containing the structure P(=X)-X-C(=X)- (X = O, S, Se) }

C07F 9/4096 . . . . . { Compounds containing the structure P(=X)-X-N (X = O, S, Se) }

C07F 9/42 . . . . Halides thereof

C07F 9/425 . . . . . { Acid or estermonohalides thereof, e.g. RP(=X)(YR)(Hal) } (X, Y = O, S; R = H, or hydrocarbon group)

C07F 9/44 . . . . Amides thereof

C07F 9/4403 . . . . . { the acid moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/4407 . . . . . { Amides of acyclic saturated acids which can have further substituents on alkyl }

C07F 9/4411 . . . . . { Amides of acyclic unsaturated acids }

C07F 9/4415 . . . . . { Amides of cycloaliphatic acids }

C07F 9/4419 . . . . . { Amides of aromatic acids (P-C aromatic linkage) }

C07F 9/4423 . . . . . { Amides of poly (thio)phosphonic acids }

C07F 9/4426 . . . . . { Amides of arylalkanephosphonic acids }

C07F 9/443 . . . . . { Amides of acids containing the structure -C(=Y)-P(=X)(XR)-N or NC-(P(=X)(XR)-N (X, Y = O, S)) }

C07F 9/4434 . . . . . { the ester moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/4438 . . . . . { Ester with hydroxyalkyl compounds }

C07F 9/4442 . . . . . { Esters with unsaturated acyclic alcohols }

C07F 9/4446 . . . . . { Esters with cycloaliphatic alcohols }

C07F 9/4449 . . . . . { Esters with hydroxyaryl compounds }

C07F 9/4453 . . . . . { Esters with arylalkanols }

C07F 9/4457 . . . . . { Compounds containing the structure C-P(=X)(X-acyl)-N, C-P(=X)(X-heteroatom)-N or C-P(=X)(X-CN)-N (X, Y = O, S) }

C07F 9/4461 . . . . . { the amide moiety containing a substituent or a structure which is considered as characteristic }

C07F 9/4465 . . . . . { of aliphatic amines }

C07F 9/4469 . . . . . { of unsaturated acyclic amines }

C07F 9/4473 . . . . . { of cycloaliphatic amines }

C07F 9/4476 . . . . . { of aromatic amines (N-C aromatic linkage) }

C07F 9/448 . . . . . { of aralkylamines }

C07F 9/4484 . . . . . { Compounds containing the structure C-P(=X)(N-acyl)-X, C-P(=X)(N-heteroatom)-X or C-P(=X)(N-CN)-X (X = O, S, Se) }

C07F 9/4488 . . . . . { Compounds containing the structure P(=X)(N-S-) (X = O, S, Se) }

C07F 9/4492 . . . . . { Compounds containing the structure P(=X) (N-C(=X)-) (X = O, S, Se) }

C07F 9/4496 . . . . . { Compounds containing the structure P(=X)(N-N-) (X = O, S, Se) }

C07F 9/46 . . . Phosphinous acids R2-P-OH; Thiophosphinous acids; Aminophosphines R2-P-NH2 { including R2P(=O)H; derivatives thereof }

C07F 9/48 . . . Phosphonous acids RP(OH)2; Thiophosphonous acids { including RHP(=O)(OH); Derivatives thereof }

C07F 9/4808 . . . . { the acid moiety containing a substituent or structure which is considered as characteristic }

C07F 9/4816 . . . . . { Acyclic saturated acids or derivatices which can have further substituents on akyl }

C07F 9/4825 . . . . . { Acyclic unsaturated acids or derivatives }

C07F 9/4833 . . . . . { Cycloaliphatic acids or derivatives }

C07F 9/4841 . . . . . { Aromatic acids or derivatives (P-C aromatic linkage) }

C07F 9/485 . . . . . { Polyphosphonous acids or derivatives }

C07F 9/4858 . . . . . { Acids or derivatives containing the structure -C(=X)-P(XR)2 or NC-P(XR)2 (X = O, S, Se) }

C07F 9/4866 . . . . { the ester moiety containing a substituent or structure which is considered as characteristic }

C07F 9/4875 . . . . . { Esters with hydroxy aryl compounds }

C07F 9/4883 . . . . [Amides or esteramides thereof, e.g. RP(NR'2)2 or RP(XR')(NR''2) (X = O, S)]

C07F 9/4891 . . . . { Monohalide derivatives RP (XR')(Hal) (X = O, S, N) (dihalide derivatives C07F 9/52) }

C07F 9/50 . . . Organo-phosphines

C07F 9/5004 . . . . { Acyclic saturated phosphines }

C07F 9/5009 . . . . . { substituted by B, Si, P or a metal (C07F 9/5027 takes precedence) }

C07F 9/5013 . . . . { Acyclic unsaturated phosphines }

C07F 9/5018 . . . . { Cycloaliphatic phosphines }

C07F 9/5022 . . . . { Aromatic phosphines (P-C aromatic linkage) }

C07F 9/5027 . . . . { Polyphosphines }

C07F 9/5031 . . . . { Arylalkane phosphines (C07F 9/5027 takes precedence) }

C07F 9/5036 . . . . { Phosphines containing the structure -C(=X)-P or NC-P }

C07F 9/504 . . . . { Organo-phosphines containing a P-P bond }

C07F 9/5045 . . . . { Complexes or chelates of phosphines with metallic compounds or metals }

C07F 9/505 . . . . { Preparation; Separation; Purification; Stabilisation }

C07F 9/5054 . . . . . { by a process in which the phosphorus atom is not involved }

C07F 9/5059 . . . . . { by addition of phosphorus compounds to alkenes or alkynes }

C07F 9/5063 . . . . . { from compounds having the structure P-H or P-Heteroatom, in which one or more of such bonds are converted into P-C bonds } (C07F 9/5059 takes precedence)

C07F 9/5068 . . . . . { from starting materials having the structure >P-Hal }

C07F 9/5072 . . . . . { from starting materials having the structure P-H } (C07F 9/5059 takes precedence)

C07F 9/5077 . . . . . { from starting materials having the structure P-Metal, including R2P-M+ }

C07F 9/5081 . . . . . { from starting materials having the structure >P-Het, Het being an

heteroatom different from Hal or Metal }

C07F 9/5086 . . . . . { from phosphonium salts as starting materials }

C07F 9/509 . . . . . { by reduction of pentavalent phosphorus derivatives, e.g. -P=X with X = O, S, Se or -P-Hal2 }

C07F 9/5095 . . . . . { Separation; Purification; Stabilisation }

C07F 9/52 . . . . Halophosphines

C07F 9/53 . . . . Organo-phosphine oxides; Organo-phosphine thioxides

C07F 9/5304 . . . . . { Acyclic saturated phosphine oxides or thioxides }

C07F 9/5308 . . . . . { substituted by B, Si, P or a metal }

C07F 9/5312 . . . . . { substituted by a phosphorus atom (C07F 9/5329 takes precedence) }

C07F 9/5316 . . . . . { Unsaturated acyclic phosphine oxides or thioxides }

C07F 9/532 . . . . . { Cycloaliphatic phosphine oxides or thioxides }

C07F 9/5325 . . . . . { Aromatic phosphine oxides or thioxides (P-C aromatic linkage) }

C07F 9/5329 . . . . . { Polyphosphine oxides or thioxides }

C07F 9/5333 . . . . . { Arylalkane phosphine oxides or thioxides (C07F 9/5329 takes precedence) }

C07F 9/5337 . . . . . { Phosphine oxides or thioxides containing the structure -C(=X)-P(=X) or NC-P(=X) (X = O, S, Se) }

C07F 9/5341 . . . . . { Organo-phosphine oxides or thioxides containing a P-P bond }

C07F 9/5345 . . . . . { Complexes or chelates of phosphine-oxides or thioxides with metallic compounds or metals }

C07F 9/535 . . . Organo-phosphoranes

C07F 9/5352 . . . . { Phosphoranes containing the structure P=C- }

C07F 9/5355 . . . . { Phosphoranes containing the structure P=N- }

C07F 9/5357 . . . . . { Polyphosphazenes containing the structure [P=N- }n (cyclic compounds 9/6581F)]

C07F 9/54 . . . Quarternary phosphonium compounds

C07F 9/5407 . . . . { Acyclic saturated phosphonium compounds }

C07F 9/5414 . . . . . { substituted by B, Si, P or a metal }

C07F 9/5421 . . . . . { substituted by a phosphorus atom (C07F 9/5449 takes precedence) }

C07F 9/5428 . . . . { Acyclic unsaturated phosphonium compounds }

C07F 9/5435 . . . . { Cycloaliphatic phosphonium compounds }

C07F 9/5442 . . . . { Aromatic phosphonium compounds (P-C aromatic linkage) }

C07F 9/5449 . . . . { Polyphosphonium compounds }

C07F 9/5456 . . . . { Arylalkanephosphonium compounds }

C07F 9/5463 . . . . { Compounds of the type "quasi-phosphonium" e.g. (C)a-P-(Y)b wherein a+b=4, b>=1 and Y=heteroatom, generally N or O }

C07F 9/547 . . Heterocyclic compounds, e.g. containing phosphorus as a ring hetero atom

C07F 9/5475 . . . { having nitrogen and selenium with or without oxygen or sulfur as ring hetero atoms; having nitrogen and tellurium with or without oxygen or sulfur as ring hetero atoms }

C07F 9/553 . . . having one nitrogen atom as the only ring hetero atom

C07F 9/5532 . . . . { Seven- (or more) membered rings }

C07F 9/5535 . . . . . { condensed with carbocyclic rings or ring systems }

C07F 9/5537 . . . . { the heteroring containing the structure -C(=O)-N-C(=O)- (both carbon atoms belong to the heteroring) }

C07F 9/564 . . . . Three-membered rings

C07F 9/568 . . . . Four-membered rings

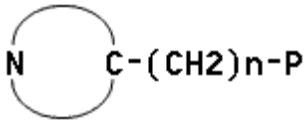
C07F 9/5683 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/5686 . . . . . { condensed with carbocyclic rings or ring systems }

C07F 9/572 . . . . Five-membered rings

C07F 9/5721 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/5722 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.



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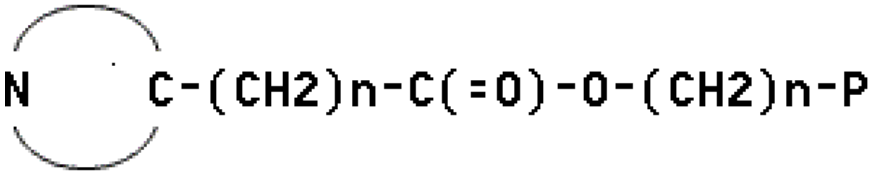
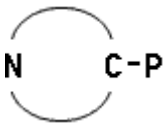


}

C07F 9/5723 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



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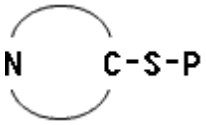
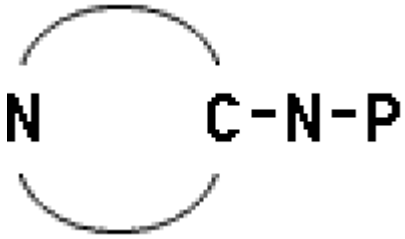


}

C07F 9/5725 . . . . . { bonded through a heteroatom }

C07F 9/5726 . . . . . { directly bonded }

C07F 9/5727 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



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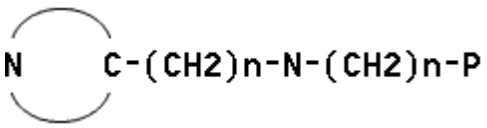


C07F 9/5728 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

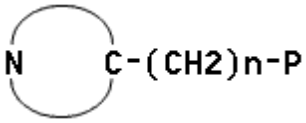
C07F 9/576 .... Six-membered rings

C07F 9/5765 ..... { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/58 ..... Pyridine rings

C07F 9/581 ..... { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/582 ..... { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.



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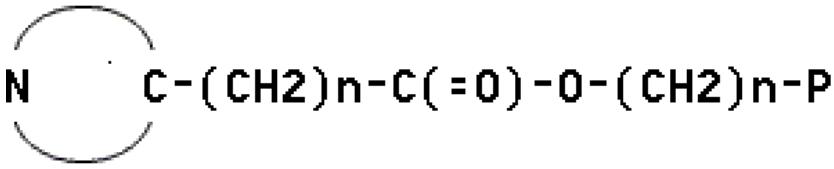
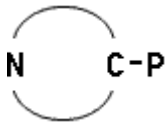


}

C07F 9/584 ..... { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



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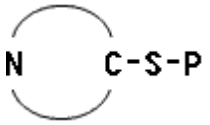
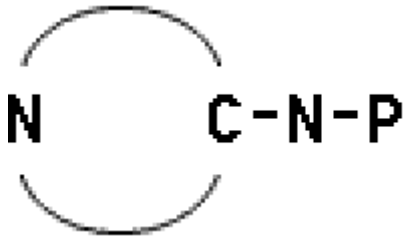


}

C07F 9/585 ..... { bonded through a heteroatom }

C07F 9/587 ..... { directly bonded }

C07F 9/588 ..... { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



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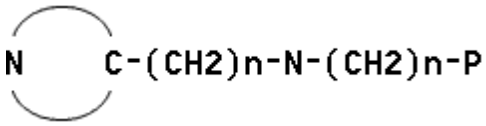
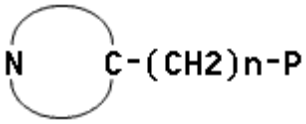


C07F 9/59 ..... Hydrogenated pyridine rings

C07F 9/591 ..... { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/592 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.



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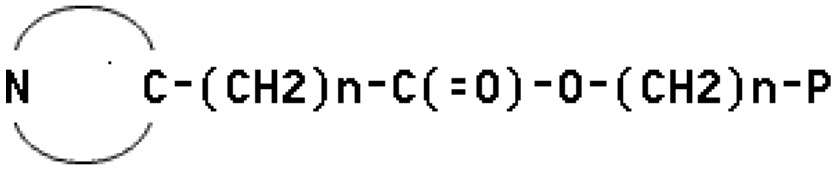
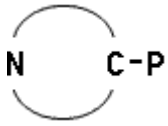


}

C07F 9/594 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



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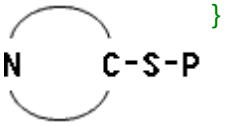
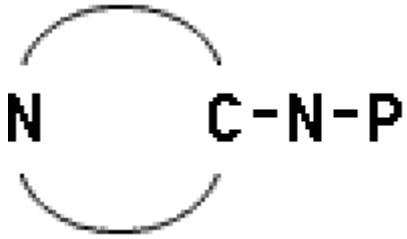


}

C07F 9/595 . . . . . { bonded through a heteroatom }

C07F 9/597 . . . . . { directly bonded }

C07F 9/598 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



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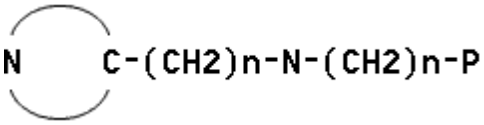


}

C07F 9/60 . . . . . Quinoline or hydrogenated quinoline ring systems

C07F 9/62 . . . . . Isoquinoline or hydrogenated isoquinoline ring systems

C07F 9/64 . . . . . Acridine or hydrogenated acridine ring systems

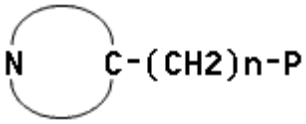
C07F 9/645 . . . having two nitrogen atoms as the only ring hetero atoms

C07F 9/6503 . . . . Five-membered rings

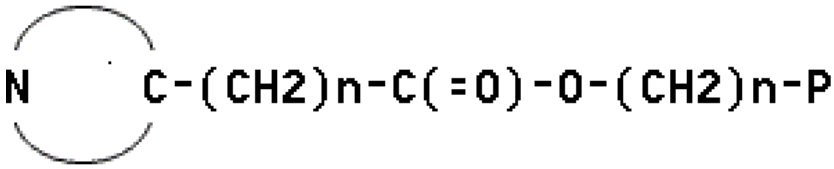
C07F 9/65031 . . . . . { having the nitrogen atoms in the positions 1 and 2 }

C07F 9/65032 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/65033 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

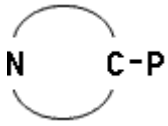


or

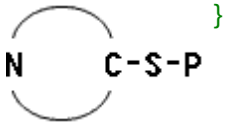


}

C07F 9/65034 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

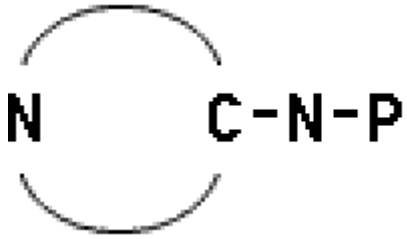


}

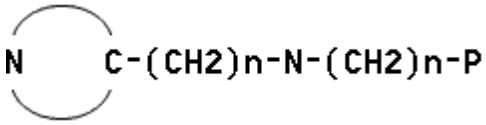
C07F 9/65035 . . . . . { bonded through a heteroatom }

C07F 9/65036 . . . . . { directly bonded }

C07F 9/65037 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



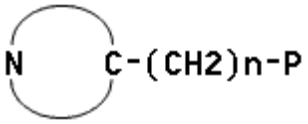
}

C07F 9/65038 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

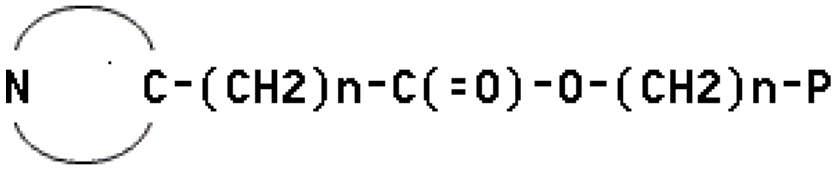
C07F 9/6506 . . . . . having the nitrogen atoms in positions 1 and 3

C07F 9/65061 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/65062 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

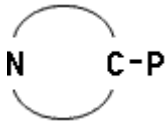


or

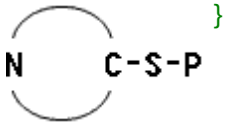


}

C07F 9/65063 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

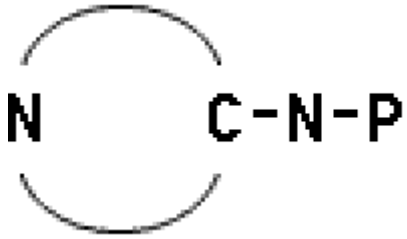


}

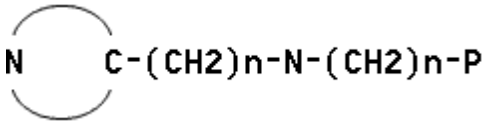
C07F 9/65065 . . . . . { bonded through a heteroatom }

C07F 9/65066 . . . . . { directly bonded }

C07F 9/65067 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



}

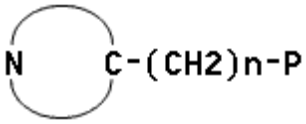
C07F 9/65068 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6509 . . . . Six-membered rings

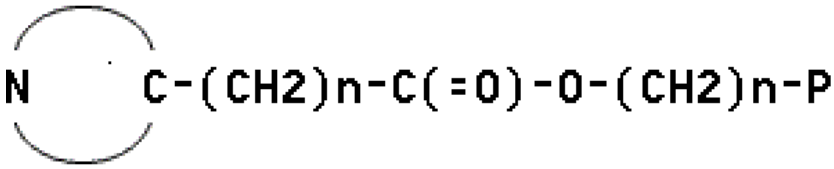
C07F 9/650905 . . . . . { having the nitrogen atoms in the positions 1 and 2 }

C07F 9/650911 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/650917 ..... { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

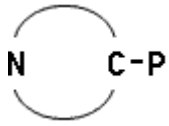


or

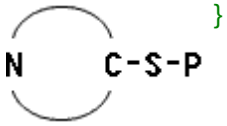


}

C07F 9/650923 ..... { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

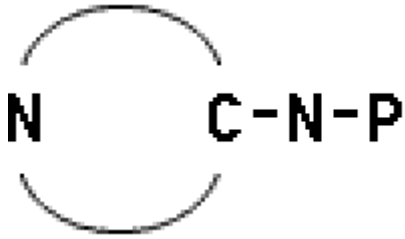


}

C07F 9/650929 ..... { bonded through a heteroatom }

C07F 9/650935 ..... { directly bonded }

C07F 9/650941 ..... { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



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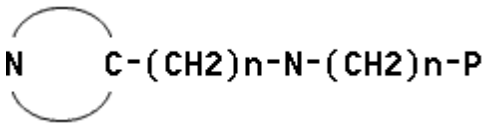


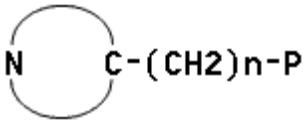
}

C07F 9/650947 ..... { condensed with carbocyclic rings or carbocyclic ring systems }

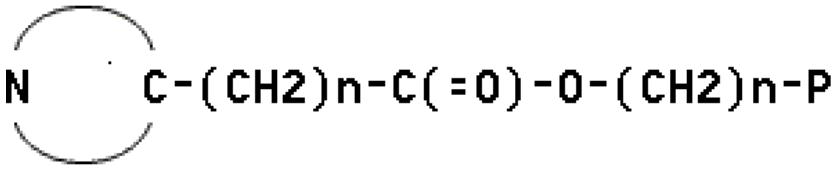
C07F 9/650952 ..... { having the nitrogen atoms in the position 1 and 4 }

C07F 9/650958 ..... { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/650964 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

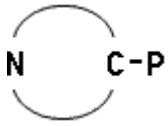


or

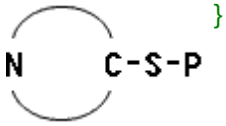


}

C07F 9/65097 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

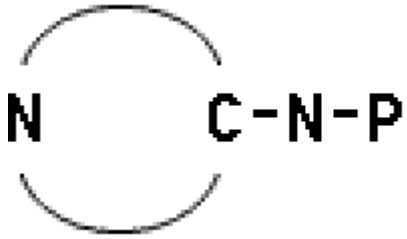


}

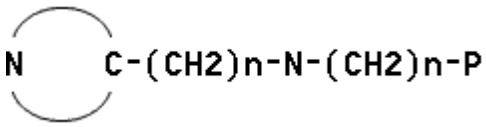
C07F 9/650976 . . . . . { bonded through a heteroatom }

C07F 9/650982 . . . . . { directly bonded }

C07F 9/650988 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



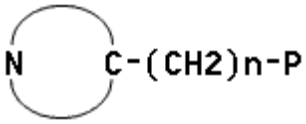
}

C07F 9/650994 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

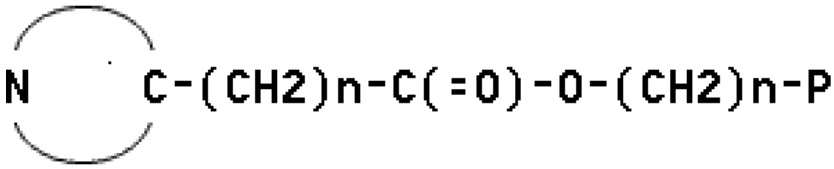
C07F 9/6512 . . . . . having the nitrogen atoms in positions 1 and 3

C07F 9/65121 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/65122 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

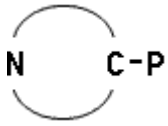


or

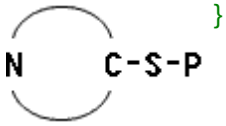


}

C07F 9/65123 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

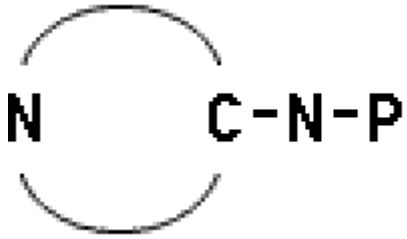


}

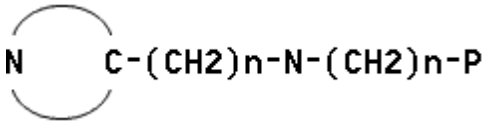
C07F 9/65125 . . . . . { bonded through a heteroatom }

C07F 9/65126 . . . . . { directly bonded }

C07F 9/65127 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



}

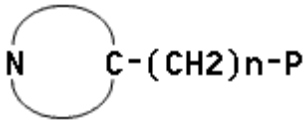
C07F 9/65128 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6515 . . . having three nitrogen atoms as the only ring hetero atoms

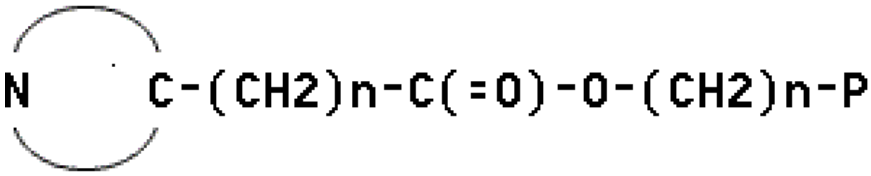
C07F 9/6518 . . . . Five-membered rings

C07F 9/65181 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/65182 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

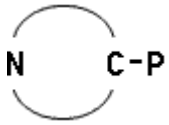


or

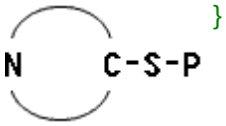


}

C07F 9/65183 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

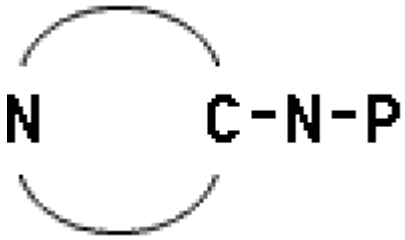


}

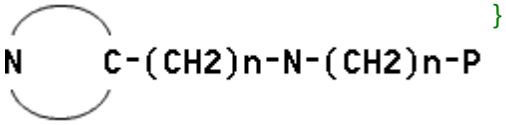
C07F 9/65185 . . . . . { bonded through a heteroatom }

C07F 9/65186 . . . . . { directly bonded }

C07F 9/65187 . . . . . { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



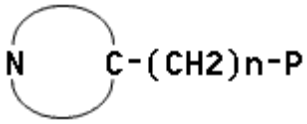
}

C07F 9/65188 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

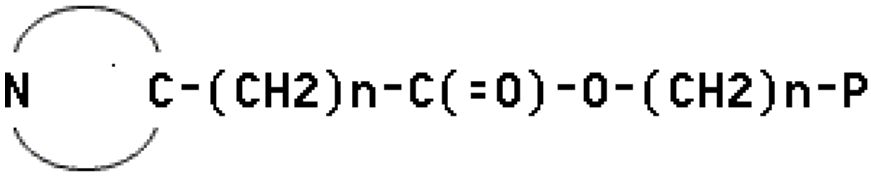
C07F 9/6521 . . . . Six-membered rings

C07F 9/65211 . . . . . { the phosphorus atom is bonded to a cyclic nitrogen atom, directly, through one or more heteroatoms or through a hydrocarbon chain which may be broken by one or more heteroatoms }

C07F 9/65212 ..... { the phosphorus atom is bonded to a cyclic carbon atom, other than directly, through a heteroatom, or through a hydrocarbon chain which may be broken by at least one nitrogen atom, e.g.

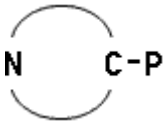


or

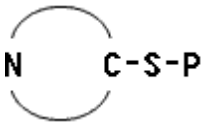


}

C07F 9/65213 ..... { the phosphorus atom is bonded to a cyclic carbon atom, directly or through a heteroatom other than nitrogen, e.g.



or

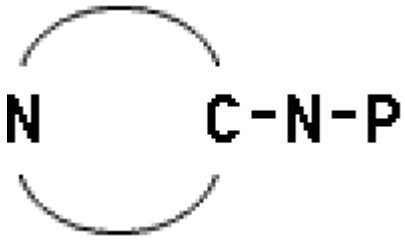


}

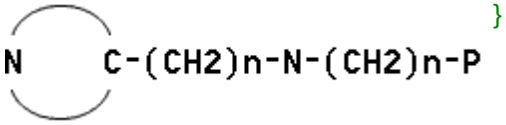
C07F 9/65215 ..... { bonded through a heteroatom }

C07F 9/65216 ..... { directly bonded }

C07F 9/65217 ..... { the phosphorus atom is bonded to a cyclic carbon atom, through a nitrogen atom or through a hydrocarbon chain which is broken by at least one nitrogen atom, e.g.



or



}

C07F 9/65218 ..... { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6524 ... having four or more nitrogen atoms as the only ring hetero atoms

C07F 9/6527 ... having nitrogen and oxygen atoms as the only ring hetero atoms

C07F 9/653 .... Five-membered rings

C07F 9/65306 ..... { containing two nitrogen atoms }

C07F 9/65312 ..... { having the two nitrogen atoms in positions 1 and 2 }

C07F 9/65318 ..... { having the two nitrogen atoms in positions 1 and 3 }

C07F 9/65324 ..... { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6533 .... Six-membered rings

C07F 9/65335 ..... { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6536 ... having nitrogen and sulfur atoms with or without oxygen atoms, as the only ring hetero atoms

C07F 9/6539 .... Five-membered rings

C07F 9/65392 . . . . . { containing two nitrogen atoms }

C07F 9/65395 . . . . . { having the two nitrogen atoms in positions 1 and 2 }

C07F 9/65397 . . . . . { having the two nitrogen atoms in positions 1 and 3 }

C07F 9/6541 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6544 . . . . Six-membered rings

C07F 9/6547 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/655 . . . having oxygen atoms, with or without sulfur, selenium, or tellurium atoms, as the only ring hetero atoms

C07F 9/65502 . . . . { the oxygen atom being part of a three-membered ring }

C07F 9/65505 . . . . . { Phosphonic acids containing oxirane groups; esters thereof }

C07F 9/65507 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6551 . . . . { the oxygen atom being part of a four-membered ring }

C07F 9/65512 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/65515 . . . . { the oxygen atom being part of a five-membered ring }

C07F 9/65517 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6552 . . . . { the oxygen atom being part of a six-membered ring }

C07F 9/65522 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/65525 . . . . { the oxygen atom being part of a seven- (or more)membered ring }

C07F 9/65527 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6553 . . . having sulfur atoms, with or without selenium or tellurium atoms, as the only ring hetero atoms

C07F 9/655309 . . . . { the sulfur atom being part of a three-membered ring }

C07F 9/655318 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/655327 . . . . { the sulfur atom being part of a four-membered ring }

C07F 9/655336 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/655345 . . . . { the sulfur atom being part of a five-membered ring }

C07F 9/655354 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/655363 . . . . { the sulfur atom being part of a six-membered ring }

C07F 9/655372 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/655381 . . . . { the sulfur atom being part of a seven- (or more)membered ring }

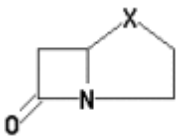
C07F 9/65539 . . . . . { condensed with carbocyclic rings or carbocyclic ring systems }

C07F 9/6558 . . . containing at least two different or differently substituted hetero rings neither condensed among themselves nor condensed with a common carbocyclic ring or ring system

C07F 9/65583 . . . . { each of the hetero rings containing nitrogen as ring hetero atom }

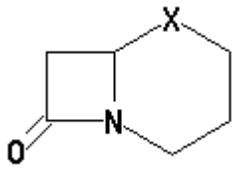
C07F 9/65586 . . . . { at least one of the hetero rings does not contain nitrogen as ring hetero atom }

C07F 9/6561 . . . containing systems of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring or ring system, with or without other non-condensed hetero rings

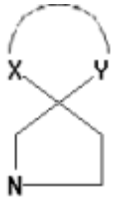
C07F 9/65611 . . . . { containing the ring system 

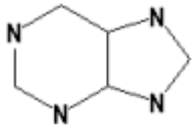
(X = CH2, O, S, NH) optionally with an additional double bond and/or substituents e.g. penicillins and

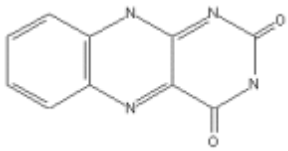
analogs }

C07F 9/65613 .... { containing the ring system  (X = CH2, O, S, NH)

optionally with an additional double bond and/or substituents e.g. cephalosporins and analogs }

C07F 9/65615 .... { containing a spiro condensed ring system of the formula  where at least one of the atoms X or Y is a hetero atom, e.g. S }

C07F 9/65616 .... { containing the ring system  having three or more than three double bonds between ring members or between ring members and non-ring members, e.g. purine or analogs }

C07F 9/65618 .... { containing the ring system,  e.g. flavins or analogues }

C07F 9/6564 ... having phosphorus atoms, with or without nitrogen, oxygen, sulfur, selenium or tellurium atoms, as ring hetero atoms

C07F 9/6568 .... having phosphorus atoms as the only ring hetero atoms

C07F 9/65681 ..... { the ring phosphorus atom being part of a (thio)phosphinic acid or ester thereof }

C07F 9/65683 ..... { the ring phosphorus atom being part of a phosphine }

C07F 9/65685 ..... { the ring phosphorus atom being part of a phosphine oxide or thioxide }

C07F 9/65686 ..... { the ring phosphorus atom being part of an organo-phosphorane }

C07F 9/65688 ..... { the ring phosphorus atom being part of a phosphonium compound }

C07F 9/6571 .... having phosphorus and oxygen atoms as the only ring hetero atoms

C07F 9/657109 ..... { esters of oxyacids of phosphorus in which one or more exocyclic oxygen atoms have been replaced by (a) sulfur atom(s) }

C07F 9/657118 ..... { non-condensed with carbocyclic rings or heterocyclic rings or ring systems }

C07F 9/657127 ..... { condensed with carbocyclic or heterocyclic rings or ring systems }

C07F 9/657136 ..... { the molecule containing more than one cyclic phosphorus atom }

C07F 9/657145 ..... { the cyclic phosphorus atom belonging to more than one ring system }

C07F 9/657154 ..... { Cyclic esteramides of oxyacids of phosphorus }

C07F 9/657163 ..... { the ring phosphorus atom being bound to at least one carbon atom }

C07F 9/657172 . . . . . { the ring phosphorus atom and one oxygen atom being part of a (thio)phosphinic acid ester:  (X = O, S) }

C07F 9/657181 . . . . . { the ring phosphorus atom and, at least, one ring oxygen atom being part of a (thio)phosphonic acid derivative }

C07F 9/65719 . . . . . { the ring phosphorus atom and, at least, one ring oxygen atom being part of a (thio)phosphonous acid derivative }

C07F 9/6574 . . . . . Esters of oxyacids of phosphorus { (C07F 9/657163 takes precedence) }

C07F 9/65742 . . . . . { non-condensed with carbocyclic rings or heterocyclic rings or ring systems }

C07F 9/65744 . . . . . { condensed with carbocyclic or heterocyclic rings or ring systems }

C07F 9/65746 . . . . . { the molecule containing more than one cyclic phosphorus atom }

C07F 9/65748 . . . . . { the cyclic phosphorus atom belonging to more than one ring system }

C07F 9/6578 . . . . having phosphorus and sulfur atoms with or without oxygen atoms, as ring hetero atoms

C07F 9/65785 . . . . . { the ring phosphorus atom and , at least, one ring sulfur atom being part of a thiophosphonic acid derivative }

C07F 9/6581 . . . . having phosphorus and nitrogen atoms with or without oxygen or sulfur atoms, as ring hetero atoms

C07F 9/65811 . . . . . { having four or more phosphorus atoms as ring hetero atoms }

C07F 9/65812 . . . . . { Cyclic phosphazenes [P=N- }n, n>=3]

C07F 9/65814 . . . . . { n = 3 or 4 }

C07F 9/65815 . . . . . { n = 3 }

C07F 9/65817 . . . . . { n = 4 }

C07F 9/65818 . . . . . { n > 4 }

C07F 9/6584 . . . . . having one phosphorus atom as ring hetero atom

C07F 9/65842 . . . . . { Cyclic amide derivatives of acids of phosphorus, in which one nitrogen atom belongs to the ring }

C07F 9/65844 . . . . . { the phosphorus atom being part of a five-membered ring which may be condensed with another ring system }

C07F 9/65846 . . . . . { the phosphorus atom being part of a six-membered ring which may be condensed with another ring system }

C07F 9/65848 . . . . . { Cyclic amide derivatives of acids of phosphorus, in which two nitrogen atoms belong to the ring }

C07F 9/6587 . . . . . having two phosphorus atoms as ring hetero atoms in the same ring

C07F 9/659 . . . . . having three phosphorus atoms as ring hetero atoms in the same ring [(N: C07F 9/65812 takes precedence)]

C07F 9/6596 . . . having atoms other than oxygen, sulfur, selenium, tellurium, nitrogen or phosphorus as ring hetero atoms

C07F 9/66 . Arsenic compounds

C07F 9/68 . . without As-C bonds

C07F 9/70 . . Organo-arsenic compounds

C07F 9/703 . . . { Complex metallic compounds }

C07F 9/706 . . . { Heterocyclic compounds containing As in the ring }
C07F 9/72 . . . Aliphatic compounds
C07F 9/723 . . . . { As bound only to carbon, hydrogen and/or oxygen }
C07F 9/726 . . . . { Compounds with chains of As }
C07F 9/74 . . . Aromatic compounds
C07F 9/743 . . . . { As bound only to carbon, hydrogen and/or oxygen }
C07F 9/746 . . . . { Compounds with chains of As }
C07F 9/76 . . . . containing hydroxyl groups
C07F 9/78 . . . . containing amino groups
C07F 9/80 . . . Heterocyclic compounds
C07F 9/803 . . . . { As bound only to carbon, hydrogen and/or oxygen }
C07F 9/806 . . . . { Compounds with chains of As }
C07F 9/82 . . . . Arsenic compounds containing one or more pyridine rings
C07F 9/84 . . . . Arsenic compounds containing one or more quinoline ring systems
C07F 9/86 . . . . Arsenic compounds containing one or more isoquinoline ring systems
C07F 9/88 . . . . Arsenic compounds containing one or more acridine ring systems

C07F 9/90 . Antimony compounds
C07F 9/902 . . { Compounds without antimony-carbon linkages }
C07F 9/904 . . { Aliphatic compounds }
C07F 9/906 . . { Heterocyclic compounds }
C07F 9/908 . . { Complex compounds }
C07F 9/92 . . Aromatic compounds

C07F 9/94 . Bismuth compounds

C07F 11/00 **Compounds containing elements of the 6th Group of the Periodic System**

C07F 11/005 . { compounds without a metal-carbon linkage }

C07F 13/00 **Compounds containing elements of the 7th Group of the Periodic System**

C07F 13/005 . { Compounds without a metal-carbon linkage }

C07F 15/00 **Compounds containing elements of the 8th Group of the Periodic System;** { General methods of preparation }

C07F 15/0006 . { compounds of the platinum group }
C07F 15/0013 . . { without a metal-carbon linkage }
C07F 15/002 . . { Osmium compounds }
C07F 15/0026 . . . { without a metal-carbon linkage }
C07F 15/0033 . . { Iridium compounds }
C07F 15/004 . . . { without a metal-carbon linkage }
C07F 15/0046 . . { Ruthenium compounds }

C07F 15/0053 . . . { without a metal-carbon linkage }
C07F 15/006 . . { Palladium compounds }
C07F 15/0066 . . . { without a metal-carbon linkage }
C07F 15/0073 . . { Rhodium compounds }
C07F 15/008 . . . { without a metal-carbon linkage }
C07F 15/0086 . . { Platinum compounds }
C07F 15/0093 . . . { without a metal-carbon linkage }

C07F 15/02 . Iron compounds
C07F 15/025 . . { without a metal-carbon linkage }
C07F 15/03 . . Sideramines; The corresponding desferri compounds

C07F 15/04 . Nickel compounds
C07F 15/045 . . { without a metal-carbon linkage }

C07F 15/06 . Cobalt compounds
C07F 15/065 . . { without a metal-carbon linkage }

C07F 17/00 Metallocenes

C07F 17/02 . of metals of the iron group or the platinum group

C07F 19/00 Metal compounds according to more than one of the preceding main groups

C07F 19/005 . { without metal-C linkages }